

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>RX03P17PCT</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/JP2005/003055</b>	International filing date ( <i>day/month/year</i> ) <b>24.02.2005</b>	Priority date ( <i>day/month/year</i> ) <b>26.02.2004</b>
International Patent Classification (IPC) or national classification and IPC <b>G01N27/64, H04J49/16</b>		
Applicant <b>JAPAN SCIENCE AND TECHNOLOGY AGENCY</b>		

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.	
2.	This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.	
3.	This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>3</u> sheets, as follows: <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).	
4.	This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input checked="" type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-37 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 2-3, 8-10, 12, 16, 18 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1, 4-7, 11, 13-15, 17, 19 received by this Authority on 31.08.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/9-9/9 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>1-19</u>	YES
		Claims _____	NO
	Inventive step (IS)	Claims <u>3-10, 14-16</u>	YES
		Claims <u>1-2, 11-13, 17-19</u>	NO
	Industrial applicability (IA)	Claims <u>1-19</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
	Document 1: WO 03/054915 A1 (Thomas LAURELL), 03 July 2003		
	Document 2: JP 06-508472 A (Finnigan Mat., Ltd.), 22 September 1994		
	Document 3: JP 08-189917 A (Hitachi, Ltd.), 23 July 1996		
	Document 4: US 6288390 B1 (Scripps Research Institute), 11 September 2001		
	Document 5: JP 2001-318217 A (Japan Science and Technology Corp.), 16 November 2001		
	Claims 1 to 2, 11 to 13 and 17 to 18		
	The inventions set forth in claims 1 to 2 and 11 to 13 do not involve an inventive step in the light of documents 1 to 2.		
	The fact that it is possible to satisfactorily constrain small droplets of a sample material upon the surface of a sample target by configuring so that the sample target has a roughened surface with an average surface roughness on the order of 0.4 microns (therein, the roughened surface corresponds to the fine convexoconcave structure wherein the concave portions or the convex portions are spaced at intervals of 1 nm to 10 μm) would have been well known to a person skilled in the		

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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art, as disclosed in document 2 for example.

Furthermore, it would have been easy for a person skilled in the art to conceive of forming fine recesses and protrusions in the bottom surfaces of the cylindrical nanovials formed in the sample target disclosed in document 1, which was configured by coating a metal upon a semiconductor substrate.

#### Claim 19

The invention set forth in claim 19 does not involve an inventive step in the light of documents 2 to 3.

Ion sources for implementing laser ionization without using a matrix are well known to a person skilled in the art, as disclosed in document 3 for example.

In configurations that employ the abovementioned well-known ion sources, the question of whether to roughen the surface of the sample target or not is merely a simple design matter that can be configured in an appropriate manner in a person skilled in the art.

#### Claims 3 to 10 and 14 to 16

The inventions set forth in claims 3 to 10 and 14 to 16 are novel and involve an inventive step in relation to documents 1 to 5.

Document 4 defines the general state of the art of the technical field pertaining to sample targets that comprise porous silicon.

Meanwhile, document 5 defines the general state of the art of the technical field pertaining to lithographic techniques for systematically forming groove-shaped recesses or hole-shaped recesses with sizes on the order

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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of a nanometer.

However, documents 1 to 5 do not disclose or suggest a sample target for implementing laser ionization wherein a fine convexoconcave structure of not less than 1 nm and not more than 1  $\mu\text{m}$  has been formed upon the sample target in a systematic manner.

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## Box No. VI Certain documents cited

## 1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
<b>JP2004-184137 A</b>	<b>02.07.2007</b>	<b>29.11.2002</b>	
<b>[E, X]</b>			

## 2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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**Box No. VIII** Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 4 to 12 and 15 to 19

With regards to the disclosures delimiting a "fine convexoconcave structure of not less than 1 nm and not more than 1  $\mu\text{m}$ " in claims 4 and 15, it is unclear which part of the convexoconcave structure has a length of "not less than 1 nm and not more than 1  $\mu\text{m}$ "; therefore, the form of the convexoconcave structure delimited by the disclosures in question is unclear.

Claim 9

With regards to the invention set forth in claim 9, it is unclear what limits apply in cases when the recesses are holes.

Claim 10

With regards to the invention set forth in claim 10, it is unclear what limits apply in cases when the recesses are grooves.